

10/715, 978

A3235 (XCP-035)

Express Mail: EV 302 354 327 US

induced bending of spring structures formed by such films is accomplished by forming the strain gradient such that volume change during annealing is not symmetric (e.g., the uppermost regions are subject to a greater contraction than the lower regions). Note that in such strain-based spring structures there is no requirement that the film be formed with an initial stress profile.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] These and other features, aspects and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings, where:

[0017] Fig. 1 is a flow diagram showing a method for fabricating spring structures according to an embodiment of the present invention;

[0018] Figs. 2(A), 2(B), 2(C) and 2(D) are simplified cross sectional side views showing methods for forming spring films according to an embodiment of the present invention;

[0019] Figs. 3(A) and 3(B) are simplified cross sectional side views showing methods for forming unreleased spring structures according to an embodiment of the present invention;

[0020] Fig. 4 is a top plan view showing two spring structures formed according to the method of Figs. 3(A) - 3(B);

[0021] Fig. 5 is a simplified cross sectional side view showing a method for releasing a benchmark spring structure according to an embodiment of the present invention;

[0022] Fig. 6 is a perspective view showing a released benchmark spring structure and an unreleased spring